FOR OFFICIAL USE ONLY

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
COMMITTEE ON SCIENTIFIC AND TECHNICAL INFORMATION

ILLEGIB

16 August 1965

STAT

MEMORANDUM TO MEMBERS OF THE COMMITTEE ON SCIENTIFIC AND TECHNICAL INFORMATION

SUBJECT: Summary of Federal Agency Comments Pertaining to the "Licklider Report"

On the following pages, you will find:

1. A summary of the Licklider Report, which was prepared for the Task Group on National Systems for Scientific and Technical Information.

2. A summary of comments about the report made by the Federal agencies at the invitation of the Chairman of COSATI.

In consideration of the growing interest in the development of principles upon which a rational national information system can be built, an interest demonstrable in and out of the government, the Licklider Report represents one of a series of important tracts, enunciating philosophy and recommendations for action, primarily, but not exclusively, by the government. Since there must be an impact on all users and producers of information as a result of the development of policies, programs and possible new organizational structures in the area of scientific and technical information, it behooves all interested and concerned individuals to understand reports such as Licklider's and enter the dialogues from which consensus will hopefully result.

Andrew A. Aines
Executive Secretary

FOR OFFICIAL USE ONLY

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
COMMITTEE ON SCIENTIFIC AND TECHNICAL INFORMATION

Summary of "Licklider" Report (OST Panel on Scientific and Technical Communications), dated 8 February 1965

Participants on Panel

William Baker	Walter M. Elsasser
A. Lee Barrett	Frederick Mosteller
Alexander Bavelas	Alvin M. Weinberg
R. Keith Cannan	J. Hilary Kelley (Exec. Sec.)
C. West Churchman	J.C.R. Licklider (Chairman)
Verner Clapp	S. Passman

General Comment - The Panel met for a total of four days. With the exception of a greater concern for libraries, the Panel admits to the same philosophies expressed by the Baker, Crawford, and Weinberg Panels.

Context of Study - Three trends were noted: (1) The growth of government arrangements under FCST and COSATI. (2) The "amorphousness" of a great variety of users in the government and private sectors. (3) The rapid advance of technology. Two kinds of administrative responsibilities were mentioned: the need to improve the information activities in the Federal R&D sector and the requirement to seek the cooperation of the non-government sector in the development of an integrated system.

Findings of the Panel - Management seems more concerned about the inadequacies of current practice than the scientific community. Engineers lean towards the views of the managers. Although the academic scientist feels that communication is intrinsic to research, he is not too concerned with the retailing of products of research. He is resistant to the imposition of constraints on how he communicates and carries out his investigations. On the other hand, managers instinctively "reach" for a system. OST should seek to meld private and public information efforts and competences to rationalize the nation's handling of scientific and technical information. Fair progress has been made in developing mechanisms to facilitate the use of government-sponsored information. In this respect, COSATI is working hard and is as effective as a committee can be representing diverse government agencies. Success is spotty in getting the scientific community to cooperate in integrating public and private services into a unified system. Despite this, the demand from some quarters for a unified system is progressively increasing. The Panel feels that the field is not yet well enough defined to justify an attempt to design a national system at this time. Why? (1) We need principles concerning centralization and distribution of functions. (2) We have to understand the real needs of generators and users of scientific and technical information. (3) We need a coherent plan. (4) Strong leadership is required.

Recommendations -

1. Strengthen OST leadership by means of a larger staff and increasing use of panels and consultants. OST should:

a. Consider and evaluate proposals and plans for an over-all national system.
b. Assess performance and progress.
c. Devise reward/penalty system.
d. Foster compatability and coherence among components of system.
e. Encourage advancement of R&D in information areas.

2. Employ the services of follow-on panels to advise OST on such matters as:

a. Means for better integration of government and private efforts.
b. Better cooperation by scientists and engineers and their voluntary organizations.
c. Scientific and technical communication.
d. A sub-panel on information problems of engineers.
e. Monitoring and encouraging system-oriented growth by non-government entities.
f. Avoidance of vast "boondoggles" in the field of storage, organization, and retrieval of information.
g. Better feedback from technology to science.

3. Study of journals, monographs, books versus source reports. Consider if government agencies have gone too far with technical or source reports and not far enough in supporting journals, monographs and books. Give attention to developing systems of libraries, extending from National libraries down to those at local level.

4. Conspicuity needs to be improved. Users in and out of government need something more understandable, available and ready to serve.

5. More active participation by scientists and engineers is needed, also strong interaction between system organizers and users.

6. Support improvement of technical writing.

7. Encourage more exploration and experimentation, especially those capable of handling actual problems and growing or evolving into operational systems with real users and real information bases. This needs to be done prior to organizing a national system.

Other Problems and Issues Discussed

1. Specialized Technical Information Centers. Panel favors, but assessment is needed.

2. Centralization and distribution. Centralization should be considered for functions of standardization, monitoring of compatability, and over-all planning, guidance and evaluation. Professional societies should, with specialized information centers, do the actual work of abstracting, synthesizing, organizing and summarizing of the literature. OST should give leadership to accelerate definition and enforcement of standards for bibliographic formats and machine-readable representation of documents. This is not the same as a huge, central repository of documents, staffed by many scientists, engineers, and information specialists to work on its contents, which the Panel does not favor. There may already be too much bibliographic control of indexing and abstracting in libraries and documentation centers in the Washington area. The Panel prefers the work to be done in closer association with on-going R&D.

3. Need more work on the "real" needs of users.

4. More effective use of computers is required. The Panel prefers a "middle course" in their employment in national systems.

5. National and Local Libraries - NLM may develop into the central focus of field-oriented libraries and activities. Library of Congress serves as the traditional library in natural and social sciences and engineering. NAL - no basis for comparison was available to the Panel. There is a need for a national library (or libraries) for natural and social sciences and engineering. Either LC undertakes this or it should be turned over to a National Library of Science and Technology, preferably in the Executive Branch.

6. Need more understanding of informal communication in over-all planning.

7. Review articles and monographs - The Panel did not arrive at a consensus.

8. Government subsidy and the publishing industry - Present principles are in conflict.

9. Publishers of business media do not see eye-to-eye with government policy and practices.

10. There is a need for deeper study of security and proprietary considerations.

Appendices - These cover:

I. Proposed exploration and experimentation in scientific and technical communication.

II. Two suggestions regarding government subsidy and the "for profit" press.

III. A concept of a "national library" system and tasks for a national library.

FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
COMMITTEE ON SCIENTIFIC AND TECHNICAL INFORMATION

Summary of Federal Agency Comments on the Licklider Report

Introduction

Comments were received from the Federal agencies with substantial scientific and technical information programs. Because of the varying programs and missions of the agencies, reactions are generally oriented towards response patterns typical of each agency, but there are variant streams of thought that appear from time to time. Additionally, it was evident that the Licklider Panel Report did not stimulate Federal agencies uniformly. Some agencies made short and sometimes pungent observations, while others seriously wrestled with the thoughts, principles and actions expressed and recommended in the report. Some of the agencies expanded their comments to cover, not only agreements and disagreements with the Panel, but what their agencies were doing along the lines suggested by report, and on occasion, in different directions. While most agencies provided one view to represent their agencies, this approach was not universally followed, as the reader will discover.

After reviewing the product of each of the agencies, it was decided that the analysis should be made by agency, rather than by the issues and recommendations shown in the Licklider Report, which would also be a logical way to summarize the agency comments. Finally, the presentation to follow departs the normal alphabetical order in favor of presenting the shorter views of some of the agencies at the beginning and more detailed ones later on. No value judgments are expressed about length, brevity, or quality of performance by the reviewer.

Agency Views

Federal Aviation Agency - This agency considers the report with favor.

Atomic Energy Commission - AEC believes that the report reiterates generalities and platitudes and that most of the recommendations are being or have been worked on by COSATI.

Department of Agriculture - Agriculture is disappointed that the Panel did not have time to observe its operation. It notes the disagreement with COSATI on readiness to design a national information system and agrees with Panel on fuller participation of scientists in work of scientific and technical information.

National Aeronautics and Space Administration - NASA approves of the report as a worthy successor to the Weinberg and Crawford reports. It likes the concept of progress through experimentation and the recommendation for increased conspicuity of government scientific and technical information

programs. NASA agrees with the Panel's stand on the Library of Congress, the National Library of Medicine, the utilization of computers, centralization of standards, over-all planning, guidance and evaluation. NASA views prospects of a National Library of Science and Technology in the Executive Branch as difficult to accomplish. The same applies to the improvement of technical writing. It attributes to the background of the Panel members their preoccupation with journal publication, while overlooking the speed and flexibility of the technical report system. Finally, NASA believes that the Panel over-estimated the value of a completely decentralized control and ignoring the role and distribution of government documentation centers such as NASA's, DDC, AEC, and the Clearinghouse.

Department of the Interior - Like AEC, Interior finds that some of the recommendations, like a stronger role for OST and COSATI, have been implemented. It also covers ground of earlier reports. The Panel was more concerned with research scientists and open literature. Interior agrees that there should be more involvement of scientists and engineers in research and information services each step of the way. The gap in communication between research scientist and information specialist and need for education of both sides were stressed. Interior agrees that libraries and information centers for services should be designed into common systems. In reviewing Panels' views on recommendations on explorations and experiments, Interior suggests organizing one or two information systems in subject matter fields where there are clearly recognized needs. These should provide full information services for researchers to the top administrator from acquisition of literature to state-of-the-art reviews. New information services should have a research arm attached to measure need, methods, and progress. This would be preferable to waiting an additional three to four years, while small research experiments in the information sciences were carried on.

National Science Foundation - NSF agrees with the Licklider position on centralization and distribution, effective use of computers, studies in informal communication, and recognition of the need of a coherent plan and strong leadership. OSIS responsibility to lead in coordination of Federal and non-Federal groups and with the private sector is stressed. An observer detects bias for experimentation as the Panel's answer for the development of improved scientific communication. He criticizes the report for not making enough distinction between leadership, planning, and design and suggests that OST distinguish and clarify the differences. It is his belief that OST should see that a coherent plan is developed and evaluated before a system design can proceed satisfactorily, also when a future national system design is prepared, OST should assess it and have other government and non-government groups do likewise. It is his belief that OST should depend on agencies to maintain contacts with non-government groups, while harmonizing and coordinating the efforts of the agencies. It is unrealistic, as he sees it, to assume that experimentation can be substituted for system design. Finally, it is his belief that in evaluating information centers, instead of looking at the products of centers, it is necessary to look at the effect of the products on performance and output of users.

Department of Defense - This agency views OST as the logical point of focus of government leadership in science communication. Its preference is for a small policymaking staff rather than a large OST staff. To get the job done, tasks may be appropriately assigned to Executive Branch agencies. DOD suggests a study of OST interest in and responsibility for technical communication in the service of the practitioner, pointing out that the attention of OST to date has been on science communication largely, while the mission-oriented agencies information efforts cover at least 75% of the government expenditures for scientific and technical information. Discussing a PSAC panel to complement the government-centered efforts of COSATI, DOD favors such an action. It also favors the formation of a panel on the transfer of information between science and technology, particularly engineering and medicine. On the subject of journals, DOD sees no gain by providing more resources for this activity geared to books, journals, etc. On conspicuity, it urges the implementation of the COSATI report on this subject. In discussing initiative for developing new approaches or information systems, the observer believes that the burden of proof resides with the system developer, rather than with the scientist and engineer. On the subject of improvement in technical writing, DOD expects that only marginal benefits would accrue. This view is held because scientists write well enough for their peers and there is a need for basic work on packaging, format and audience goals, before work on content and style. On explorations and experiments, DOD is generally in favor. Among other actions, it suggests reliable experimentation in full-scale situations. DOD agrees that information centers should be subjected to further review and monitoring, that the real needs of users must be understood, and that use of computers must be rational and judicious. DOD urges more research work to improve informal communication processes, testing ideas like increasing the number of review journals or publishing reviews side by side with the original articles, and studying the issue of government subsidy for the publishing industry.

Department of Commerce - This agency sees the Panel product as a first rate effort to clarify issues and approaches and adjudges COSATI's National Systems Task Group efforts as compatible. It finds the outline of experiments useful, but suggests adding those seeking to assess the usefulness of scientific and technical information efforts to the R&D programs. It agrees on the establishment of government standards for better report writing by agencies and contractors. Another agency observer characterizes the report as a random collection of philosophic approaches. He contends that the report fails to distinguish between journal literature and "unpublished" report literature problems. It also fails to distinguish between problems in communication for report versus journal literature, as well as ignoring the vast operations of societies in covering journal literature. Improving technical writing in journal literature is more properly a problem for non-government groups. He points out that no distinction is made between journal and report literature processing and if coordination by OST for standards enforcement is difficult inside government, it is not likely to be easier outside. He finds that the Panel report is not clear as to what the government role is in the integration of communication by books, journals,

and monographs in a national system. The use of Federal funds here would be reflected only in library or society support. Referring to follow-on panels for OST and more activity for OST, it is his belief that this may present a problem. He suggests that OST might take the lead in funding "across agency" experiments and monitoring agency projects. Other comments made by this observer: Both government and non-government information centers should be evaluated by an independent group. There is no mention of regional services or of depository library problems. Distinction between technical and professional press is not clear. The mission orientation of government agencies makes a disciplinary review or state-of-the-art digests difficult to accomplish. Obsolescence of documents is speeded by application of ideas in development. Funding and coordination of large scale operations are problems. In nearly all agencies, documentation operations have no research funds. No one agency has a mission of government-wide information handling.

Department of Health, Education and Welfare - Six representatives of this agency reveal their thoughts about the Licklider Report.

Observer A - The report is thoughtful, well-balanced, and perceptive, he finds. Its recommendations are acceptable. He is pleased with its concentration on the open literature and the need to obtain the cooperation of the private sector. He believes there is need to distinguish between science and engineering re improvement of technical writing--both have different requirements. In reference to the leadership of OST and others for definition and enforcement of standards for bibliographic formats and machine-readable representations of documents, this witness urges caution, arguing that autonomy and standardization do not mix well together. He fears that government can alienate the private sector if standards are not aligned with developments in the private sector. He insists that common standards for all Federal agencies are unrealistic.

Observer B - believes that the report and recommendations, like all issuances from the new breed of science communicators, largely ignores the pre-existence of an influential and skilled operating establishment of specialists, generalists, and scientists in several sectors of the total area of communication.

Observer C - agrees generally with the report's principles and its recommendations and is pleased that the report recognizes communication other than engineering and development.

Observer D - does not believe that the report will be useful, although he does not have real disagreement with its recommendations. He regrets that the Panel did not have enough time to develop its ideas. In his opinion, the committee wrongfully assumed it was necessary to convince someone that scientific and technological communication cannot be reduced to a single

de-humanized mechanism. It is his belief that the Panel jousted with a windmill, worrying about the timeliness of developing a national system. He declares that problems and issues...easily survive the committee's discussion of them, but praises the real, positive conclusion the report makes--that centralized planning, guidance, and leadership will be required to make the system work. Referring to standardization, he states that the right amount will be vital to its proper functioning.

Observer E - contends that the report rejects the Crawford Panel's concept of replacing free enterprise institutional forms with government-sponsored and operated information systems. He believes that the Licklider Report returns to the basic premise of the Baker Report and that both are middle of the road compromises between government-controlled and laissez-faire science information systems. It is his view that realistic appraisal of... private systems leads to the role of government in modifying such systems; hence, even with grants and contracts, the government can only exhort, coax and persuade. These, he notes, are political techniques and OST may need socio-political rather than engineering-oriented studies to get things across. He words reluctance in giving OST a more aggressing role without an increase of responsibility or accountability. He also shows concern about the multiplicity of follow-on panels involving scarce, highly-skilled manpower, and wonders if these panels will result in more light or more noise. It is his view that the Licklider approach to the open literature and new report-handling systems is better balanced than those of Crawford and Weinberg. He warns against the danger of "over-conspicuity"; with the assumption that decentralization is best for abstracting, synthesizing, organizing, and summarizing the literature; and against establishing new national libraries in the absence of proven needs. He concurs in getting scientists and engineers into an active role, agrees with Licklider that the design of a national system may be premature, and likes the experimental system approach. It is his view that in improving coverage of state-of-the-art reviews and monographs, government should only encourage and support professions involved in basic sciences. He also prefers modifying existing library systems than creating an a priori system complete with service publics.

Observer F - believes the problem is how to involve interacting agencies at the grass roots level and suggests that demonstration projects may be the best way. He expresses his understanding of the reluctance of the program manager to relinquish control over resources he feels he needs to run programs against the promise of higher effectiveness through coordination, standardization, or centralization of information-handling procedures. Older and less efficient methods will disappear only when demonstration projects prove themselves.